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Technical and Aesthetic Standards for Small Cell Siting

Georgetown Municipal Light Department
April 2019

Columbia Telecommunications Corporation

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Contents

Figures

1 Introduction

The Georgetown Municipal Light Department (Georgetown Light) has established these technical and aesthetic standards (Standards) to govern access to and use of Georgetown Light poles by wireless carriers, infrastructure companies, or others (collectively referred to as "Attaching Entities" or "Applicants") for installation of small Wireless Facilities, as defined by the U.S. Federal Communications Commission. These facilities are commonly called "small cells." The small cells and all associated equipment are referred to in these standards as "Wireless Facilities."

These standards are intended to protect the primary purposes of utility poles, light poles, and other fixtures (that is, to support utility cables and equipment and to provide illumination) and to ensure public safety and utility employee safety. The technical standards describe in detail whether and how a particular structure can be used for Wireless Facilities attachment. After a proposed placement is determined to be acceptable according to the technical standards, the aesthetic standards then ensure that the technically feasible options are also aesthetically acceptable.

These Standards are part of an evolving process that considers the ongoing development of communications technologies as well as a recent FCC order entitled "Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment" (the Order).[1] The Standards may be amended to accommodate future technological and regulatory changes.

All Attaching Entities must follow the most current version of the National Electrical Safety Code (NESC) and all other applicable engineering standards and FCC standards. These Georgetown Light Standards use national safety standards and federal rules as a foundation, but Georgetown Light's unique operational requirements, as well as local aesthetic requirements, also inform these Standards.

[1] "In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment," Declaratory Ruling and Third Report and Order, WT Docket No. 17-79, WC Docket No. 17-84, 2018 WL 4678555, (rel. September 27, 2018) ("Order") (available online: https://docs.fcc.gov/public/attachments/FCC-18-133A1.pdf).

2 Pre-Application Requirements

Georgetown Light has created an application form that accompanies these Standards. The form may be downloaded at igeorgetownlight.com. Before Georgetown Light will accept an application, Attaching Entities must complete the following steps.

2.1 Execute Master Agreement

Attaching Entities must execute a master agreement with Georgetown Light prior to making an application to install equipment on Georgetown Light poles. Attaching entities must contact Georgetown Light at info@georgetownlight.com to obtain the forms and procedures. The master agreement contains the terms and conditions for Wireless Facilities attachment on Georgetown Light poles.

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2.2 Submit a Complete Application

Applications must be fully completed before they will be considered by Georgetown Light. Applications may be submitted to info@georgetownlight.com.

3 Review, Approval, and Construction Process

Georgetown Light will review the application and the design proposed by the Applicant. If the application does not comply with these Standards, Georgetown Light will reject it and send it back. Terms, conditions, and procedures on make-ready, pole replacement, installation, and maintenance work are outlined in the master agreement. Pole replacement and structural analysis requirements are described in Section 4.3 of these Standards.

Once Georgetown Light approves the application Georgetown Light will perform any required make-ready (in the power space on utility poles, or on Georgetown Light-owned streetlights), will notify Attaching Entities consistent with existing Georgetown Light policy, and will replace utility poles and streetlights as necessary.

If Georgetown Light determines that the pole needs to be replaced to provide space and clearance or other reasons, the Applicant shall pay for the cost of pole replacement and all other make-ready. If new poles are needed, Georgetown Light shall install and own the new poles. In the portion of Georgetown where Verizon sets the poles, Verizon determines whether and how to replace the pole.

The Applicant shall provide on-site training of Georgetown Light personnel to safely install and maintain the Wireless Facilities equipment, as well as RF occupational training related to working in close proximity to this equipment.

Georgetown Light shall perform all work in the utility pole power space, including installation and maintenance. Once the make-ready is done, Georgetown Light will authorize the Attaching Entity to do the approved work below the power space on utility poles and on light poles.

Technical drawings identifying all electrical specifications and requirements for the Wireless Facilities attachment shall be provided to Georgetown Light and should accompany every application.

Georgetown Light shall consider complete applications received from multiple Attaching Entities to attach to the same Pole on a “first-come, first-served,” non-discriminatory basis.

- If Georgetown Light receives a subsequent application for the same pole from a second prospective Attaching Entity following acceptance of a complete application and prior to completing make-ready electrical construction or issuing a Notice to Proceed on said first application, Georgetown Light shall reject the second application and any subsequent applications for the same pole, if there was no consideration of the proposed attachments from the application which was first in time.

- Georgetown Light will reconsider the rejected application if it is revised and resubmitted to eliminate the conflict with the first in time application previously approved.
- In the event the Attaching Entity fails to pay for make-ready construction within the timeline in the agreement, Georgetown Light will reject the application and accept other applications for that pole.

4 Small Cell Equipment Standards

This section describes Georgetown Light's technical and aesthetic requirements for small cells.

4.1 Pole-Mounted Equipment

As of the date of this version of the Standards, typical pole-mounted small cell equipment comprises:

1. Antennas on the upper part of pole
2. Radios, fiber terminations, and other equipment located in enclosures or cabinets
3. A power meter and power disconnect switch, usually located in two separate, smaller enclosures
4. Power disconnect must be mounted outside areas that exceed RF exposure limits (per FCC).

Figures 1 through 3 are conceptual drawings intended to demonstrate the basic elements of a small cell attachment and how they typically fit together; the drawings are not to scale or representative of actual structures.

Figure 1~~Figure 1~~ is an example of a small cell on a utility pole. Figure 2~~Figure 2~~ illustrates a small cell on a light pole. Figure 3~~Figure 3~~ shows a small cell on a customized light pole designed to conceal the cabinet. Detailed typical drawings are provided in Appendix A.

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Figure 1: Conceptual Drawing of a Small Cell on a Utility Pole

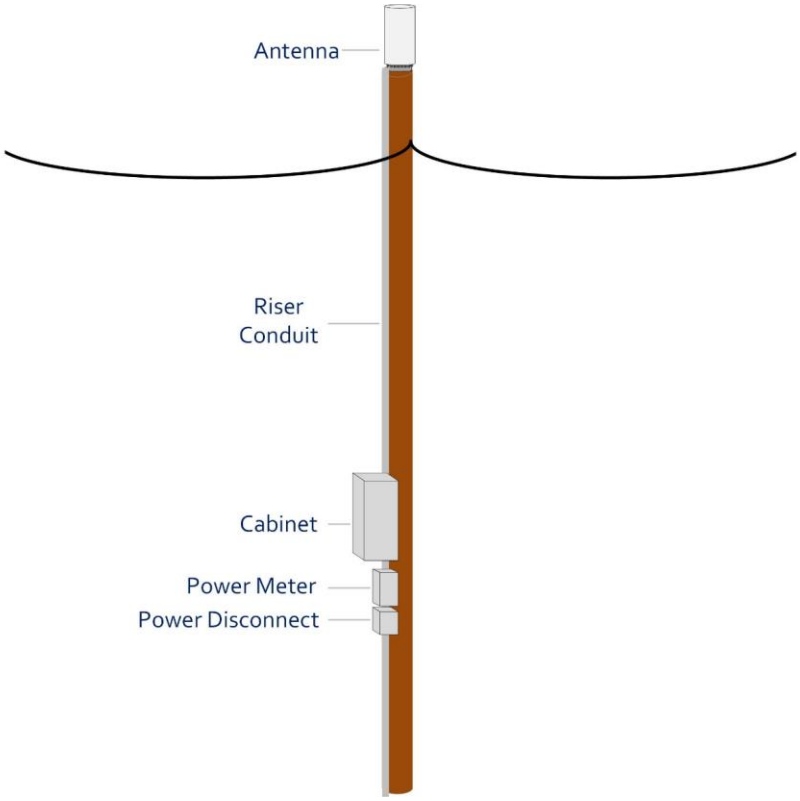

Figure 2: Conceptual Drawing of a Small Cell on a Light Pole

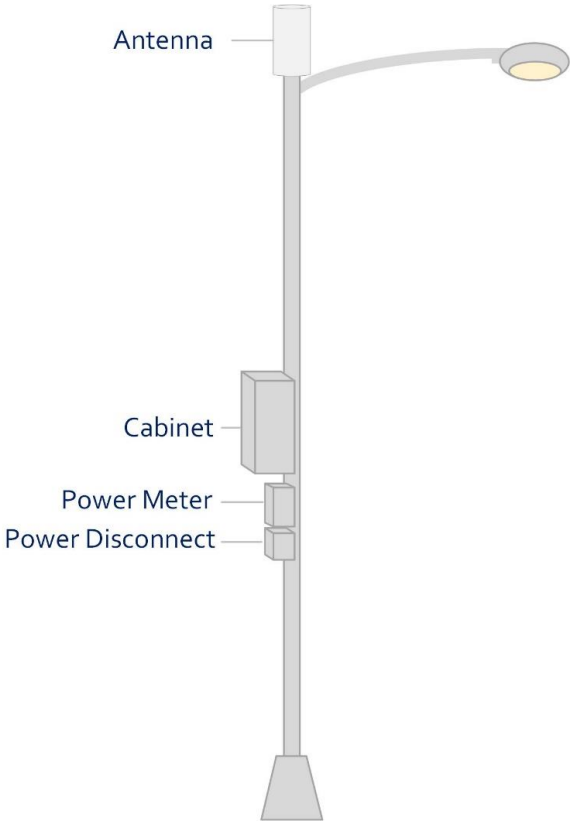

Figure 3: Conceptual Drawing of a Small Cell on a Light Pole with Concealed Cabinet

In all cases, the placement of small cells shall be consistent with existing structures and aesthetics, in harmony with the surroundings, and as unobtrusive as possible.

For example, in the downtown area, small cells on light poles must be consistent with the existing decorative light poles, calling for a design that is comparable in scale and incorporates the design characteristics of those poles.

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In the event an Applicant seeks to place a small cell in a manner that does not comply with the aesthetic standards, it must request a waiver.

4.2 Use of Wooden Utility Poles

Georgetown Light's order of preference for siting Wireless Facilities on wooden utility poles is contained in the following list. But if no such poles are available, Attaching Entities should submit

an application for making attachments on poles they find suitable and Georgetown Light will review the application and consider moving existing attachments at the Attaching Entity's cost. Georgetown Light maintains sole discretion over the suitability of the pole.

1. Stub poles
2. Poles with no primary that are at an intersection
3. Poles with no primary that are near a property line
4. Non-decorative streetlights, if replaced by a streetlight meeting these standards
5. Other poles without primary if the Applicant can show there is no other viable option
6. Decorative streetlight poles replaced with a pole that is aesthetically in keeping with the replaced pole

Wireless Facilities shall not be installed on:

- Poles containing controls such as fire alarm, police signal, or traffic signals;
- Poles with capacitor controls, regulator controls, recloser controls, air switch operating handles, or an existing three-phase overhead transformer bank;
- Poles with single-phase transformers that are not accessible to mechanized equipment (i.e., a bucket truck);
- Poles with underground electric or communication riser conduits; poles not accessible to mechanized equipment (i.e., a bucket truck); or
- Double-circuit poles.

Risers must be the same color as the pole and mounted on back side of the pole. Messenger strand shall be bonded.

4.3 Utility Pole Replacement or Structural Analysis Requirement

The standard and default approach for attaching to utility poles will be for the pole to be replaced by Georgetown Light at the Attaching Entity's cost to accommodate a new wireless facility attachment. Any poles in poor condition (per the judgment of Georgetown Light) or that are 10 or more years old shall be replaced with Class 2 pole with adequate height to accommodate equipment. Pole top extensions shall not be used. If additional height is needed a new pole shall be installed.

Commented [DT3]: Dave there is some new language here suggested by Mansfield. Seemed sensible to share, but maybe you will want to tweak

If the Attaching Entity believes the pole may provide space and structural support for all existing attachments, plus the proposed Wireless Facilities attachment, the Attaching Entity shall provide an engineering design and Pole Loading Analysis (PLA) calculations to justify the use of the existing pole.

Each PLA must be undertaken by a Registered Professional Engineer licensed in the Commonwealth of Massachusetts (Engineer) to undertake and complete the engineering design, the physical testing of pole integrity, and PLA calculations. Georgetown Light reserves the right to approve the contractor selected to perform this work; such approval shall not be unreasonably withheld.

Acceptable software for PLA calculations shall be a commercially available product with general industry acceptance. Should the Applicant or its contractor use a commercially available software application that Georgetown Light does not possess, the Applicant shall make available to Georgetown Light at least one software license. The Applicant will gather the physical and technical information required to conduct a PLA.

4.4 Use of Light Poles

A utility light pole that is replaced with a new pole must be replaced with a new pole at the same location that is designed primarily to serve the purpose of the original pole (i.e., lighting) while also serving as a supporting structure for the Wireless Facilities attachment.

The standard approach will be for a light pole to be replaced with a light pole designed to accommodate the small cell. In the event the Applicant believes the existing pole can support the structure and fulfill all other aesthetic and technical standards, the Applicant shall provide an industry-standard PLA certified by the Engineer indicating that the specific pole will safely support the load.

Replacement poles shall resemble existing poles:

- TBD type
- TBD type decorative

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4.5 Mid-Span Microcell Installations

Microcell wireless equipment can be attached to existing or proposed wireline installations. All mid-span installations shall be no closer than 15 inches and no further than 72 inches from an Georgetown Light pole, including any attached external antenna. Midspan wireless installations cannot exceed 18 inches in length, 15 inches in height, and 12 inches in depth. The Attaching Entity shall provide engineering design and pole loading analysis (PLA) calculations to justify the

use both adjacent poles. Power disconnect is typically located on one of the strand-mounted components, on the outside.

5 General Technical and Aesthetic Requirements and Guidelines

- Subject to further discussions, Wireless Facilities shall be installed with a minimum 30-foot setback from residential buildings and a minimum 20-foot setback from commercial buildings.
- Georgetown Light prefers the use of poles at intersections and lot lines.
- No new poles should be installed where poles do not currently exist, unless the Applicant can demonstrate to Georgetown Light's satisfaction that there is no other option to provide service.
- Wireless Facilities by a single provider should be installed with a minimum spacing of 500 feet in residential areas.
- Georgetown Light prefers the use of stealth design elements.
- Georgetown Light prefers the use of tapered shapes that smoothly integrate into structures (avoiding, for example, new rectangular boxes).
- The Applicant shall minimize the size and aesthetic difference between a replacement structure and the original pole or structure.
- In downtown areas, Wireless Facilities should use banners and coloring to match surrounding light poles and fixtures.
- No facilities shall be installed in a park or in a right-of-way within 250 feet of a park.

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5.1 RF Exposure

Attaching Entities shall comply with all provisions and guidelines of the FCC OET Bulletin 65, as may be amended from time to time, and shall submit a report certifying FCC OET 65 compliance for each Wireless Facilities installation. The following elements, at a minimum, must be contained within the report:

- A statement of compliance (or non-compliance);
- Date of the report;
- Date of statement of compliance;
- Pole number proposed for the Wireless Facilities installation;
- Attaching Entity's site or identification number for the Wireless Facilities installation;

- GPS coordinates of the proposed pole;
- Calculation of RF power at the radios or other electronics;
- Calculation of RF power at the antennas; and
- Location of the applicable signage with above ground level height listed.
- Upon request by Georgetown Light, the Applicant shall perform RF field tests while the Wireless Facility is in operation, supervised by Georgetown Light to demonstrate compliance with FCC OET 65.

5.2 RF Signage Requirements:

Approved signage compliant with FCC OET Bulletin 65 shall be posted at each Pole or Streetlight Pole hosting a Wireless Facilities installation, and/or at multiple locations on such pole structure as required by FCC OET 65.

The RF signage shall comply with the appropriate and predetermined exposure level applicable to: "General Public", "Occupational Worker", and "Specialized Worker" as shown in Figure 4 below. All signage shall be 8" x 12" and made of weather, corrosion, and Ultra-Violet (UV) resistant materials.

Figure 4: RF Signage

5.3 Emergency RF/ Power Shut-Off

Each approved Wireless Facilities installation shall have a clearly marked disconnect switch adjacent to the electronics cabinet and located outside areas that exceed RF exposure limits. Once the shut-off switch is placed in the open position, the electronics equipment related to the installation shall not be energized. Additionally, no RF transmissions shall be emitted by any antenna related to the installation.

5.4 Riser Cable

Riser cables to connect antennas and antenna accessory equipment, backhaul services, and power lines shall be in conduit on the back side of wooden utility poles with top side weatherheads. Power cables transporting AC power shall be in separate conduit from DC power or telecommunications cable.

5.5 Conduit Requirements

All conduit affixed to poles shall be Schedule 40 PVC. Any conduit passing through the power space shall be nonmetallic and non-conductive and painted to match the pole. These conduits shall not exceed a diameter of two inches (2”). Only the minimum number of conduits necessary for the attachment shall be placed. No exposed riser cable slack shall be stored externally. All slack shall be stored in junction boxes or equipment cabinets or on snowshoes on the aerial cable. On light poles, no cables shall be visible on the exterior of the pole.

5.6 Transition conduit

Conduit transitions to above ground shall be in schedule 40 RGS conduit with galvanized finish. All coupling points shall be threaded mechanical or solvent-welded and watertight.

5.7 Licensed Frequencies

Antennas shall only transmit or receive frequencies that are licensed by the FCC to the Applicant or to the carrier the Applicant represents. In the event the Applicant wishes to add another carrier or change the carrier network using the Wireless Facilities, the Applicant shall notify Georgetown Light in writing of the change in carrier and frequencies.

Frequency bands listed by the FCC to be unlicensed and available for open use, may be transmitted or received, as long as they do not cause interference with another Attaching Entity, FCC-licensed entity, or Georgetown Light.

5.8 Attachment Position and Defined Space

In no circumstance shall an antenna clearance be less than specified by the NESC. Radio equipment shall be housed in the wireless equipment cabinet. Non-antenna equipment shall not be mounted within the antenna area or pole top space.

5.9 Point of Demarcation

The Backhaul Network Interface Device and point of demarcation are to be clearly identified on the submitted engineering drawings, as required in the Application, with the provider of backhaul services clearly identified.

5.10 Fiber Backhaul

The default method for connecting backhaul to wireless facilities shall be connection of Georgetown Light-provided dark fiber to the Wireless Facilities at the point of demarcation. The preferred approach shall be for Georgetown Light to construct dark fiber from its network-to-network interconnection point in XXX to the Wireless Facilities and provide a connectorized pair of fibers and slack cable at the point of demarcation.

If the point of demarcation is on a utility pole, Georgetown Light shall construct the fiber to the cabinet with 20 feet of cable slack.

If the point of demarcation is in a slab-mounted cabinet, with the antenna on a utility pole, Georgetown Light shall construct the fiber to the pole with sufficient additional slack to enable the Applicant to pull the fiber to the cabinet and connect through its own conduit to the point of demarcation.

If the antenna is on a streetlight pole, with the point of demarcation in a cabinet on or in the pole, Georgetown Light shall construct the fiber in underground conduit to a meet-me handhole near the base of the pole, with 50 feet of slack.

If the antenna is on a streetlight pole, with the point of demarcation in a cabinet on a slab, Georgetown Light shall construct the fiber in underground conduit to a meet-me handhole near the slab, with 50 feet of slack.

Fiber provided by Georgetown Light shall comply with the G.652D standard. Typical Georgetown Light fiber construction uses ADSS cable installed aerially in the communications or power space or in underground conduit, depending on the local conditions.

Fiber shall be tested end-to-end by Georgetown Light before handoff to the Applicant. Testing shall be deemed successfully completed if: (1) maximum fiber losses meet manufacturer specifications, with an allowance for splices and connectors; (2) individual splice losses do not exceed 0.1 dB; and (3) maximum mated connector losses do not exceed manufacturer specifications. Testing will be performed by Georgetown Light personnel and may be observed by designated representatives of the applicant.

Georgetown Light shall be responsible for maintenance of the fiber according to the terms of the master license agreement.

An alternative method of connecting backhaul to wireless facilities is for the applicant to construct its own fiber, or for the applicant to contract with a third party to construct the fiber. If it seeks to attach the fiber to Georgetown Light utility poles, the applicant or the third party constructing the fiber must have a separate pole attachment agreement, and the fiber installation must comply with all policies and procedures for third-party wireline pole attachment.

5.11 Wireless Backhaul

The Wireless Installation can be connected via wireless backhaul services. The volume and height of any antenna used for wireless backhaul services is counted towards the total antenna size in Section 5.14.

5.12 Backup Power

Battery backup power devices shall be installed with a transfer switch to prevent back-feeding into the electrical system. No other types of backup power shall be permitted.

5.13 Georgetown Light Work on a Pole

Georgetown Light shall open the Service Disconnect Switch prior to performing any work on an Georgetown Light pole in order to de-energize the Antenna. Any backup power shall also be disconnected when the Service Disconnect Switch is operated. Georgetown Light shall de-energize Wireless Facilities prior to performing any work on a pole structure and provide twenty-four (24) hour without prior notice to the Applicant. Such advance notice may be provided by telephone or email. In an emergency, Georgetown Light may de-energize the equipment without prior notice.

5.14 Signage

Attaching Entities shall install 8” x 12” signs or decals made of weather, corrosion, and UV resistant materials easily visible from the ground level. At a minimum, each sign or decal shall indicate the Attaching Entity’s name, emergency 24-hour contact number, and unique identifier for that site.

5.15 Pole-Mounted Antennas

The following requirements apply to pole-mounted antennas:

- Any Antenna in the Pole Top Space must have 60 inches clearance from the closest electrical conductor. U-Guard must cover the cables which run from a pole top antenna to the wireless equipment cabinet and must be installed opposite of “B” phase on the pole structure.
- The total volume of pole-mounted antennas must not exceed 3 cubic feet on a single pole.

- Pole-mounted antennas must be no taller than 48" (4 feet).
- Pole-mounted antennas must have a smooth cylindrical shape (ideally, a single canister, or multiple separate antennas placed inside sheeting that is flush with the pole, or a form factor in which multiple antennas merge into a single smooth shape). No separately mounted antennas will be allowed on a single installation (for example, physically separate panel antennas for each sector).
- Pole-mounted antennas must be flush-mounted or placed in line with the pole.
- Antennas on light poles must be same color as the pole. Antennas on wooden utility poles mush be a neutral, unobtrusive color (e.g., black, brown, dark green).

5.16 Cabinets

5.16.1 Pole-Mounted Cabinets

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- Cabinets are allowed on the sidewalk side of wooden utility poles.
- Cabinets are allowed on the sidewalk side of light poles except in downtown areas.
- An acceptable alternative to external cabinets on a light pole would be equipment placed inside the pole, such as in the base of the pole in a way that integrates with the design of the pole.
- Outside downtown areas, cabinets may either be mounted on a pole or on a concrete slab within 50 feet of the pole where the antenna is mounted.
- Cabinets mounted on poles must have at least an 8-foot clearance from the ground, or the minimum clearance required by the latest edition of the National Electrical Safety Code (NESC), whichever is greater.
- Cabinets must be flush-mounted to poles.
- Rectangular cabinets on poles are limited to 48" (height) by 24" (width) by 18" (depth); cabinets that are non-rectangular in shape must be comparable or less in volume and visual impact.
- Georgetown Light prefers placing pole-mounted equipment in enclosures with tapered shapes, which are less obtrusive than rectangular cabinets.
- The power meter and power disconnect switch must be located below the cabinet or (in the case of a light pole) inside the pole.

- Cabinets on light poles must be same color as the pole. Cabinets on wooden utility poles mush be a neutral, unobtrusive color (e.g., black, brown, dark green).

5.16.2 Surface-Mounted Cabinets

- Surface-mounted cabinets must be on a concrete slab, and where possible must be placed next to existing pedestals and cabinets (for example, near traffic signal controllers, transformers or other utility pedestals).
- Surface-mounted cabinets must be the same color as other nearby pedestals or cabinets. Where there are no other nearby pedestals or cabinets, the cabinets should be the same color as the pole housing the antenna.
- Surface-mounted cabinets must be no larger than 10 cubic feet in volume, and with height, width, and depth each not exceeding 3.5 feet.

5.17 Lighting and Noise

- No lighting is allowed on Wireless Facilities attachments; if there are lights on the supplied equipment, they must be covered, removed, or deactivated.
- Wireless Facilities attachments in residential neighborhoods may not create noise greater than 50 dB measured at 20 feet from the device.

5.18 Bonding and Grounding

Per the guidelines stated in the NESC, it is the policy and practice of Georgetown Light to ground all Pole structures installed as part of Georgetown Light's distribution system and streetlight service. Attaching entities shall ground their equipment to the multi-ground neutral vertical provided by Georgetown Light. All of the following defined Wireless Facilities components, or pole appurtenance listed, must be bonded:

- Antenna(s)
- Antenna brackets (if applicable)
- Riser conduit(s)
- Radios and other electronics
- Cable messenger strand

Appendix A: Pole-Mounted Wireless Facilities Typical Drawings

Figure 5: Pole with Secondary Power and Antenna on Top Space with Slab-Mounted Equipment Cabinet

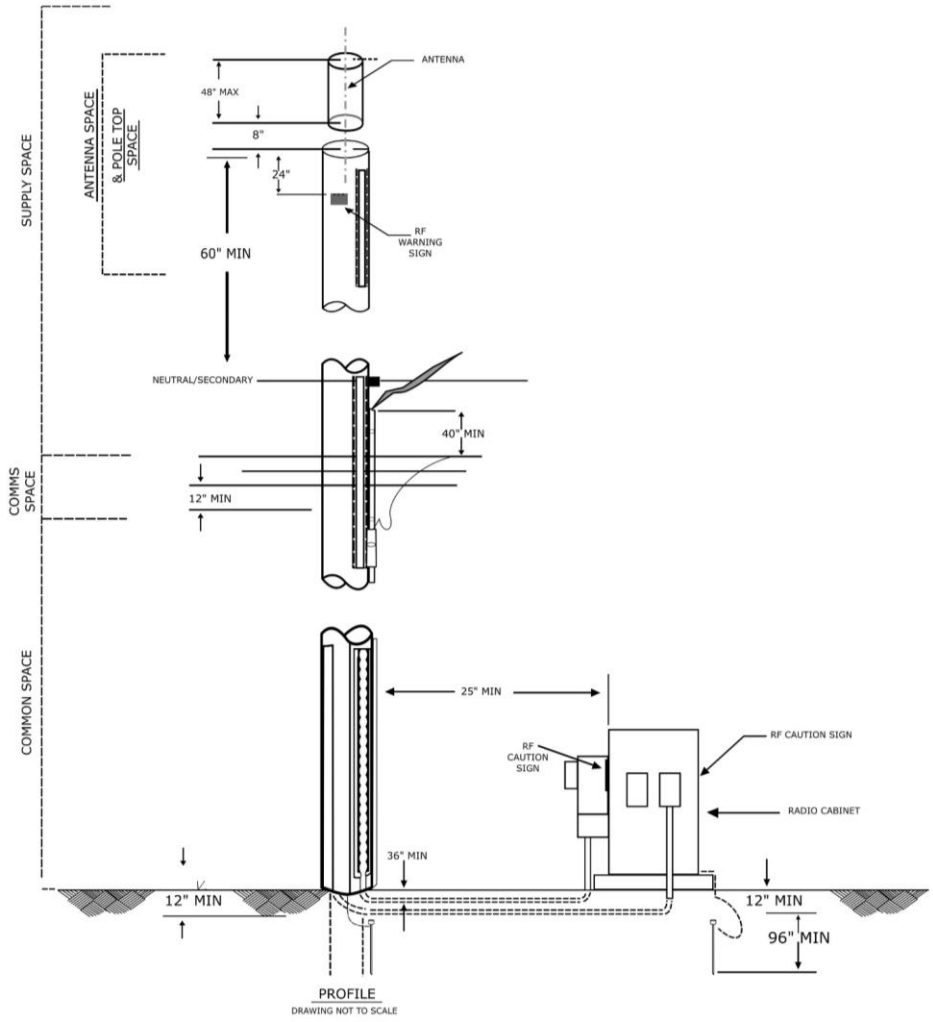

Figure 6: Pole with Secondary Power and Antenna on Top Space with Pole-Mounted Equipment Cabinet

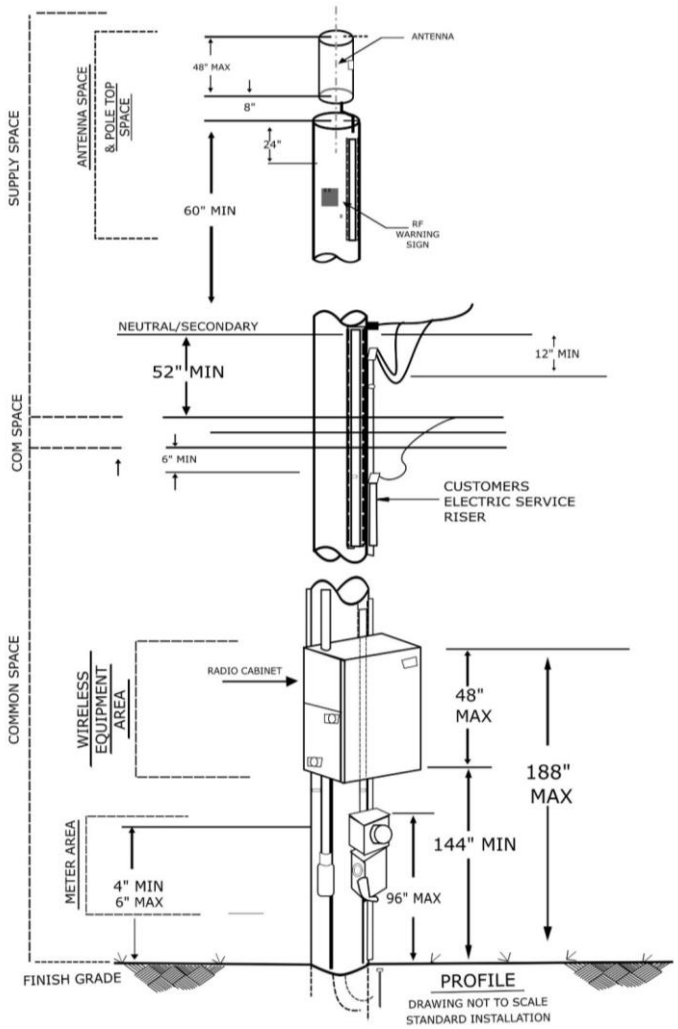

Figure 7: Pole with Secondary Power and Antenna on Top Space with Overhead-Fed Streetlight and Slab-Mounted Equipment Cabinet

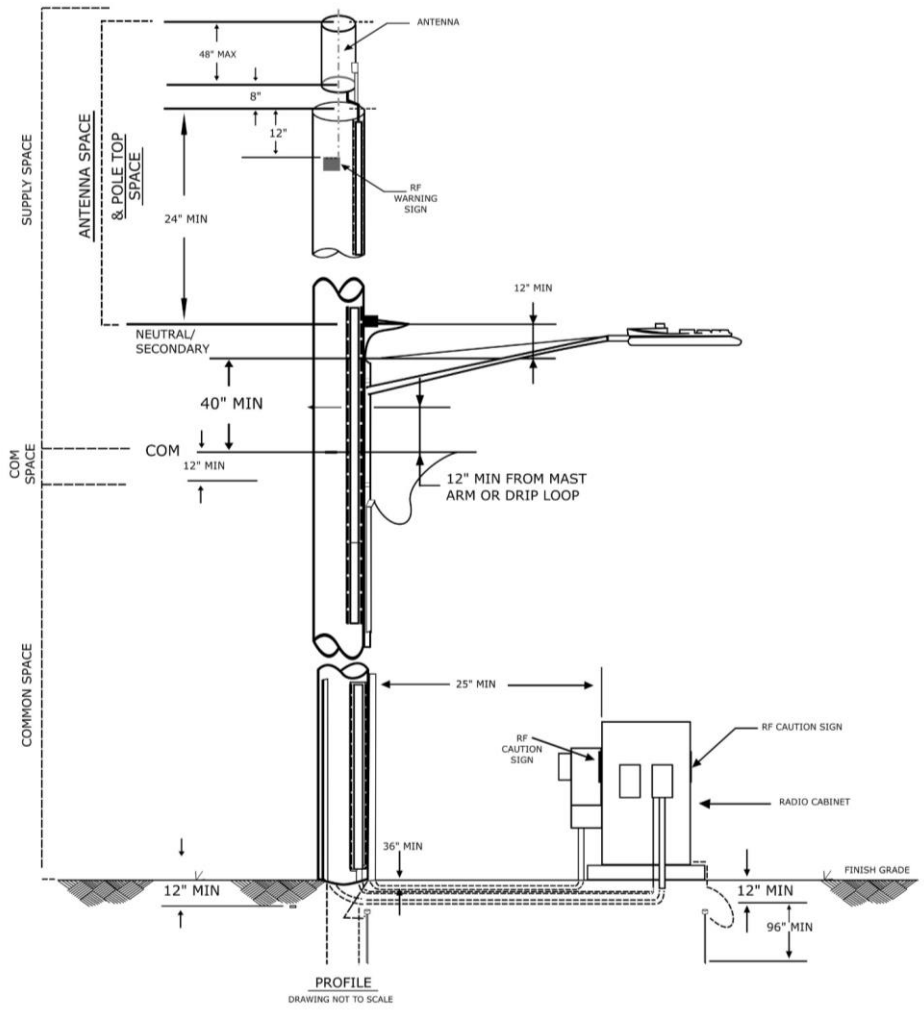

Figure 8: Pole with Secondary Power and Antenna on Top Space and Overhead-Fed Streetlight Pole with Mid-Pole Wireless Backhaul Antenna and Slab-Mounted Equipment Cabinet

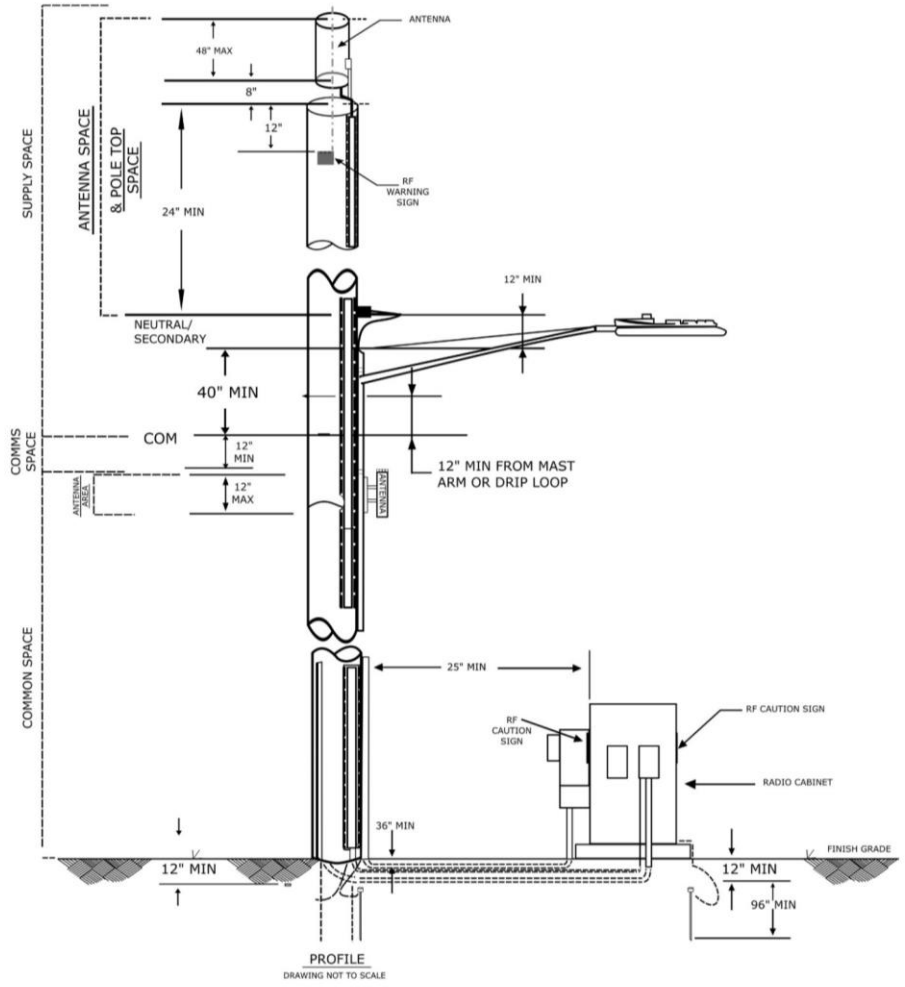

Figure 9: Pole with Secondary Power and Overhead-Fed Streetlight with Pole-Mounted Equipment Cabinet

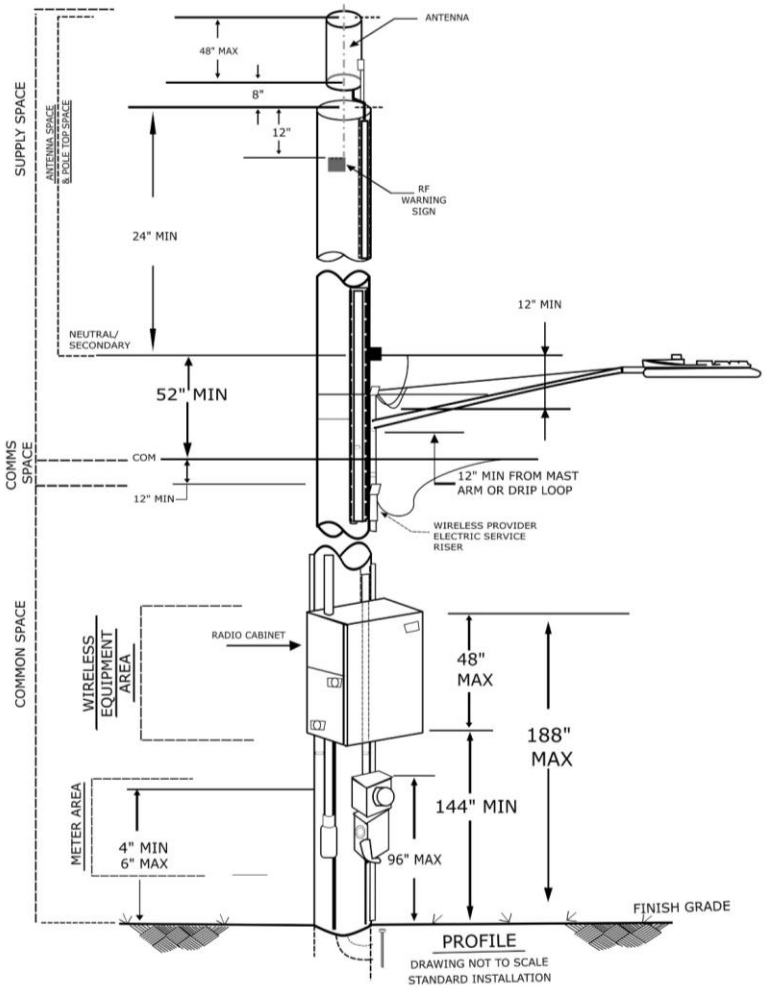

Figure 10: Pole with Secondary Power and Overhead-Fed Streetlight with Mid-Pole Wireless Backhaul Antenna and Pole-Mounted Equipment Cabinet

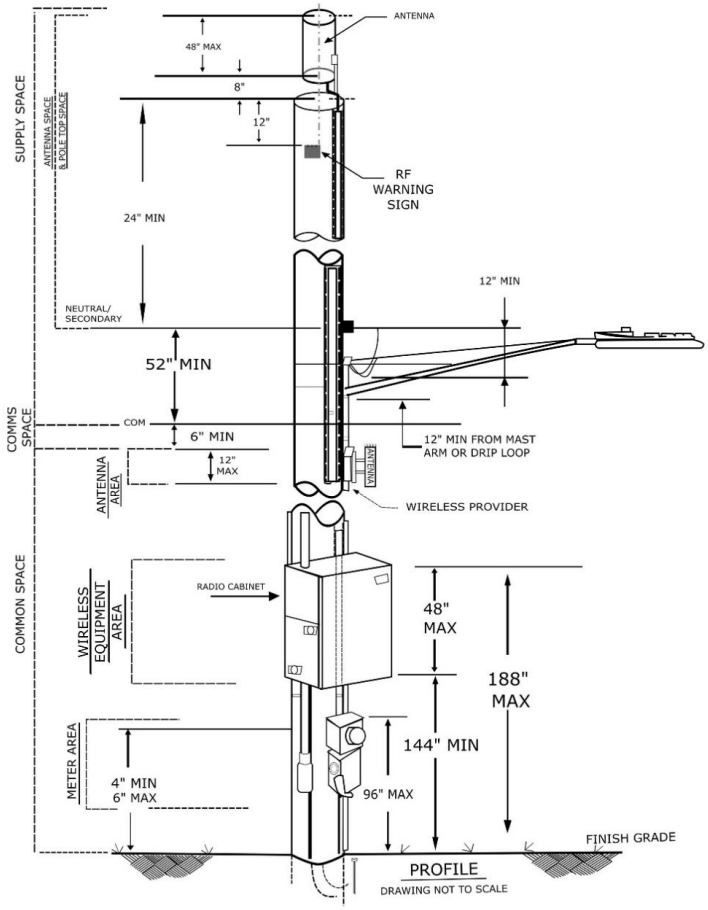

Figure 11: Pole with Primary Power and Strand-Mounted Antenna with Slab-Mounted Equipment Cabinet

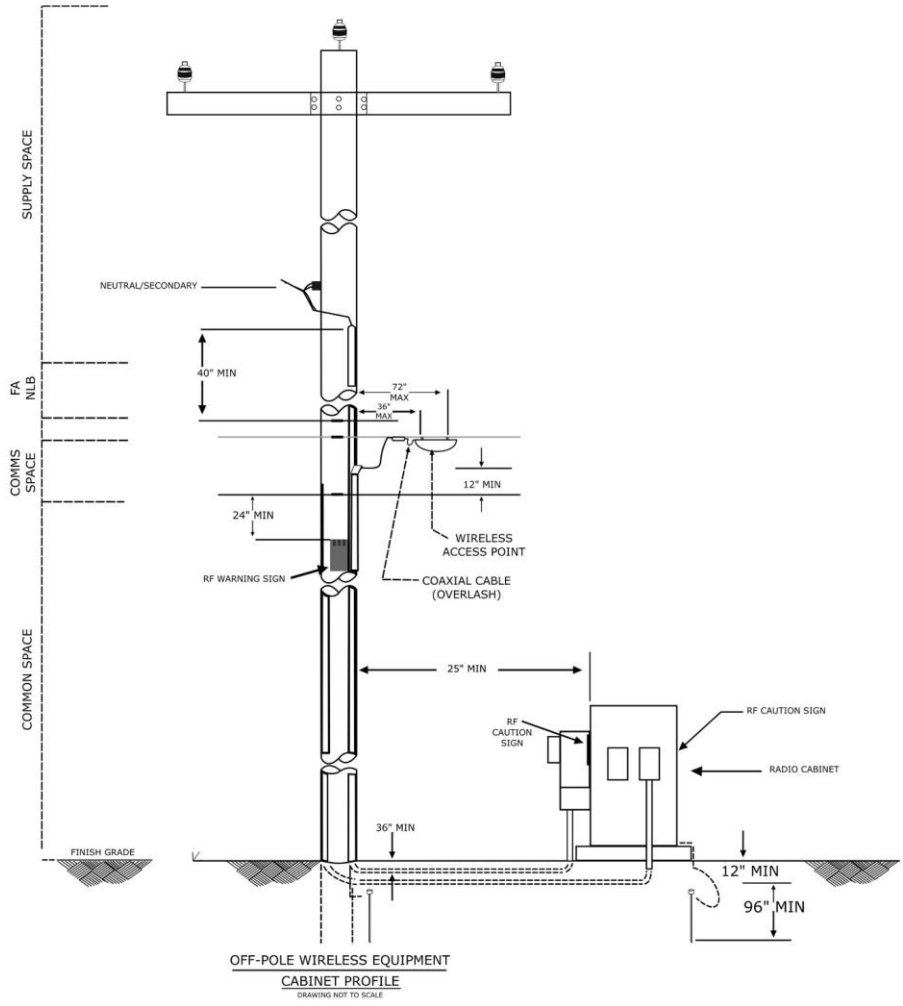

Figure 12: Pole with Primary Power and Antenna on Top Space with Slab-Mounted Equipment Cabinet

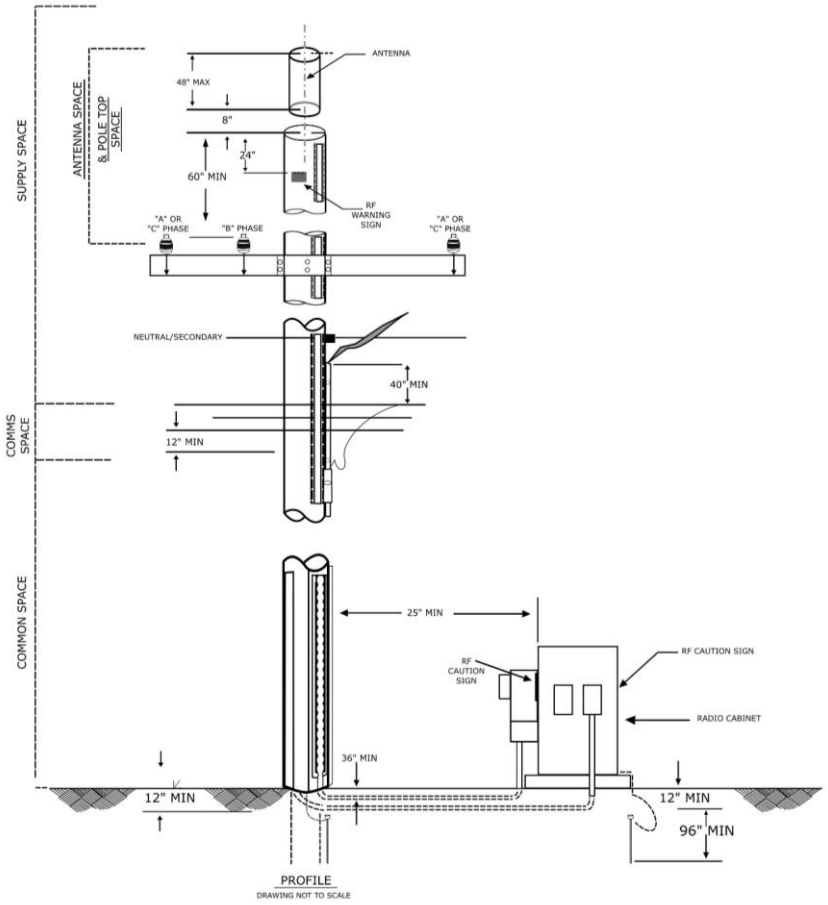

Figure 13: Pole with Primary Power and Antenna on Top Space with Mid-Pole Wireless Backhaul Antenna, and Slab-Mounted Equipment Cabinet

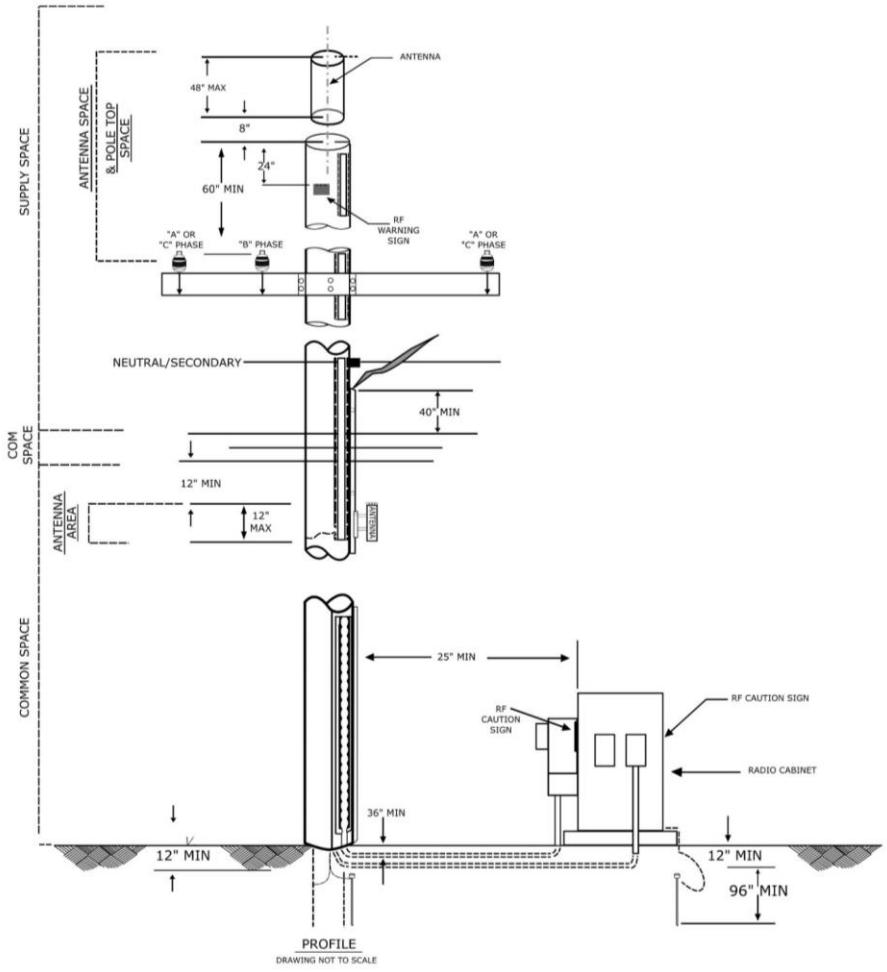

Figure 14: Pole with Primary Power and Mid-Pole Wireless Backhaul Only (no Antenna) with Pole-Mounted Equipment Cabinet

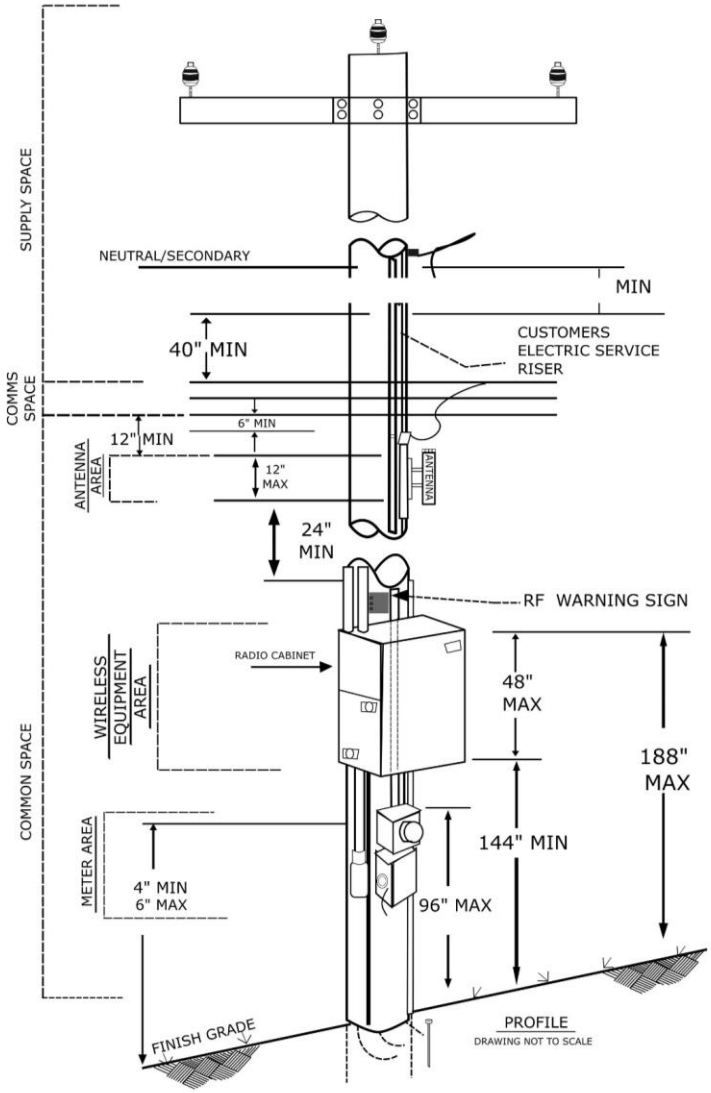

Figure 15: Pole with Primary Power and Antenna on Top Space with Pole-Mounted Equipment Cabinet

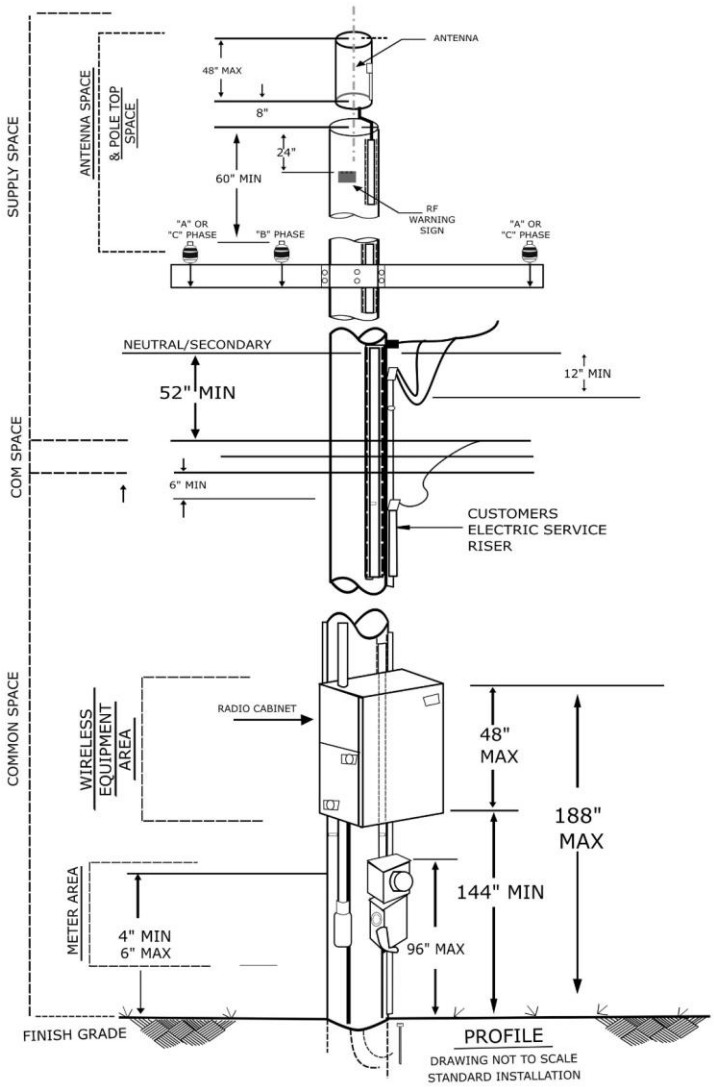

Figure 16: Pole with Primary Power and Antenna on Top Space with Mid-Pole Wireless Backhaul Antenna and Pole-Mounted Equipment Cabinet

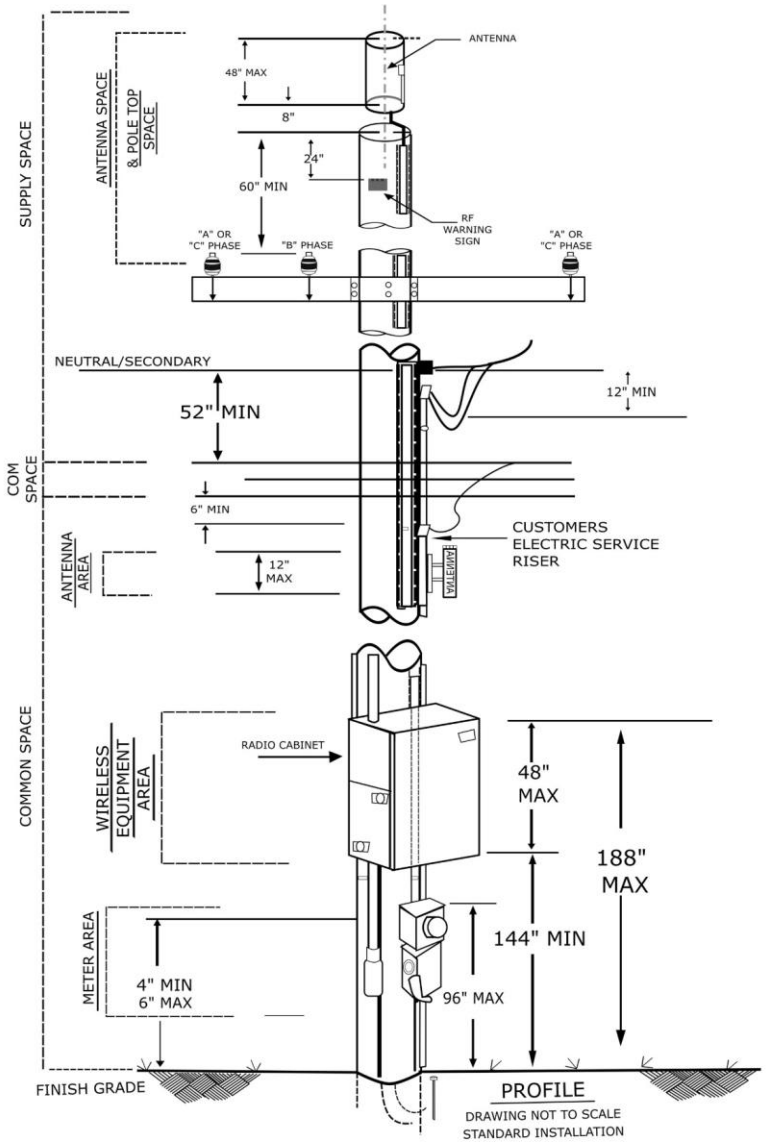

Figure 17: Pole with Hendrix Primary Power and Overhead-Fed Streetlight with Mid-Pole Wireless Backhaul Antenna and Pole-Mounted Equipment Cabinet

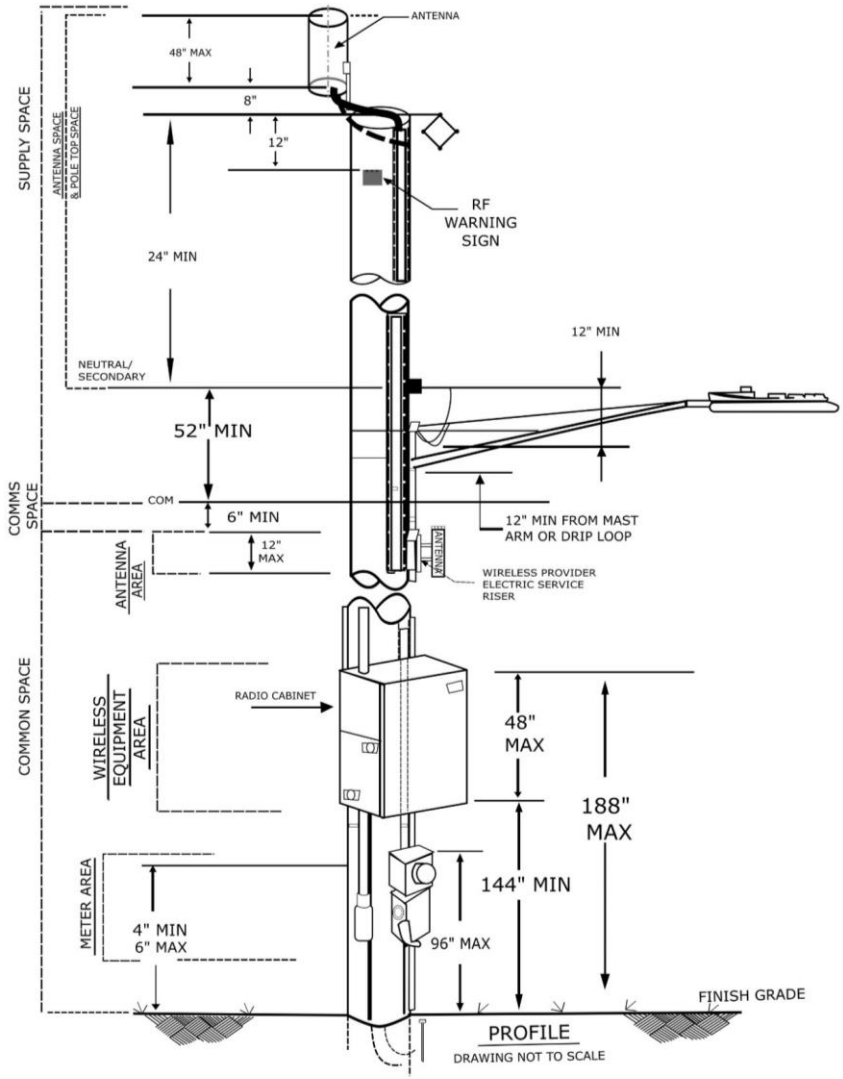

Figure 18: Pole with Hendrix Primary Power and Overhead-Fed Streetlight with Slab-Mounted Equipment Cabinet

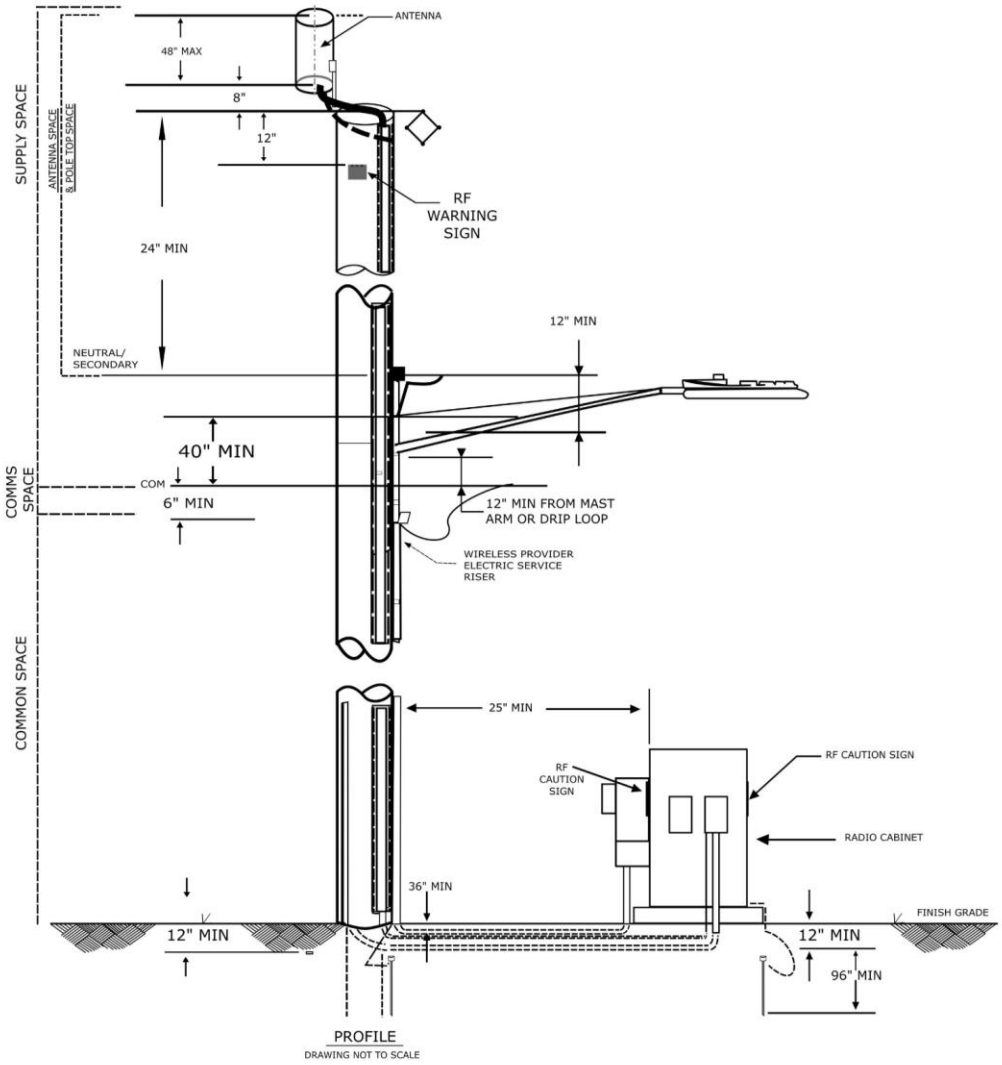

Figure 19: 30-foot or 40-foot Streetlight Pole with Antenna on Top and Single Cobra Head and Slab-Mounted Equipment Cabinet

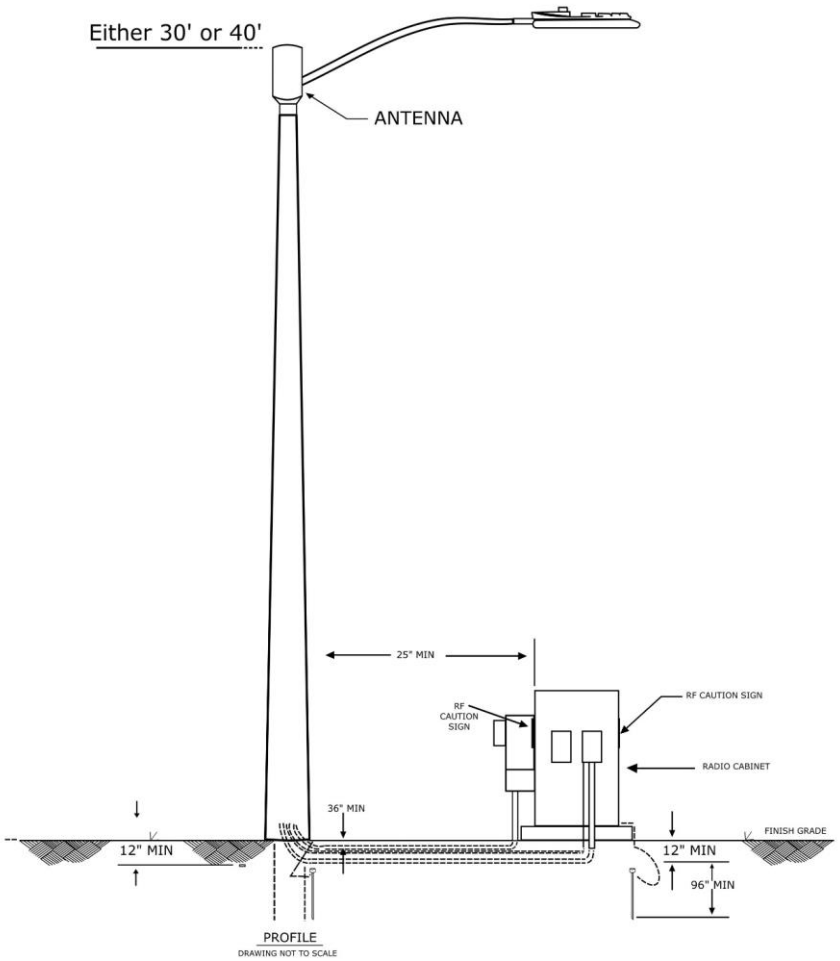

Figure 20: 30-foot or 40-foot Streetlight Pole with Antenna on Top and Dual Cobra Head and Slab-Mounted Equipment Cabinet